

Calculus

Limits

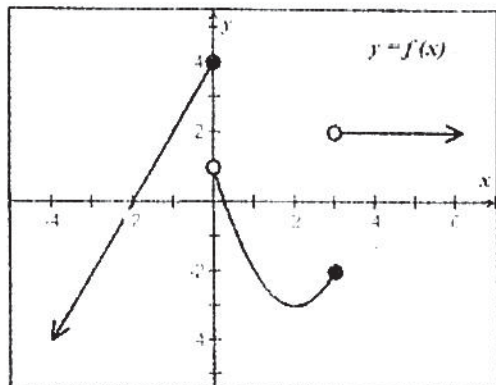
Workbook

Understanding the Limit Form A

Name _____

Date _____ Period _____

Use the graph below to find the limits.



1. $\lim_{x \rightarrow 0^-} f(x) =$

2. $\lim_{x \rightarrow 0^+} f(x) =$

3. $\lim_{x \rightarrow 3^+} f(x) =$

4. $\lim_{x \rightarrow 3^-} f(x) =$

5. $\lim_{x \rightarrow \infty} f(x) =$

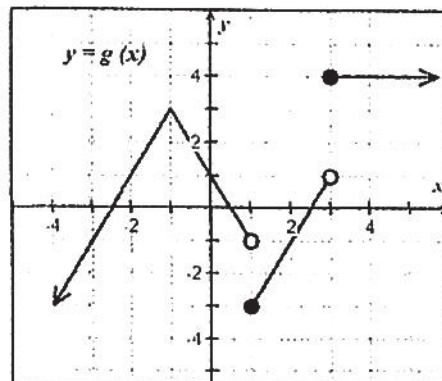
6. $\lim_{x \rightarrow -\infty} f(x) =$

Understanding the Limit Form B

Name _____

Date _____ Period _____

Use the graph below to find the limits.



1. $\lim_{x \rightarrow 1^-} g(x) =$

2. $\lim_{x \rightarrow 1^+} g(x) =$

3. $\lim_{x \rightarrow \infty} g(x) =$

4. $\lim_{x \rightarrow 3} g(x) =$

5. $\lim_{x \rightarrow -1} g(x) =$

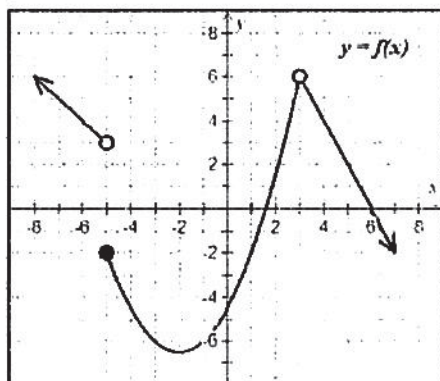
6. $\lim_{x \rightarrow -\infty} g(x) =$

Understanding the Limit Form C

Name _____

Date _____ Period _____

Use the graph below to find the limits.



1. $\lim_{x \rightarrow -5^+} f(x) =$

2. $\lim_{x \rightarrow -5^-} f(x) =$

3. $\lim_{x \rightarrow 3} f(x) =$

4. $\lim_{x \rightarrow \infty} f(x) =$

5. $\lim_{x \rightarrow -\infty} f(x) =$

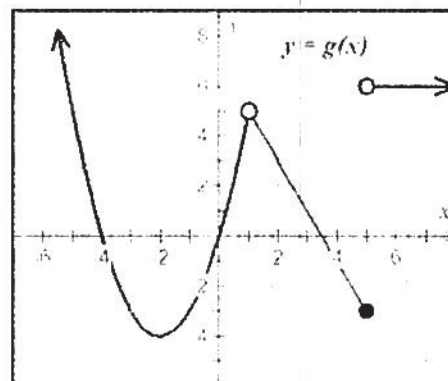
6. $\lim_{x \rightarrow -5} f(x) =$

Understanding the Limit Form D

Name _____

Date _____ Period _____

Use the graph below to find the limits.



1. $\lim_{x \rightarrow 1^+} g(x) =$

2. $\lim_{x \rightarrow 5^-} g(x) =$

3. $\lim_{x \rightarrow 5^+} g(x) =$

4. $\lim_{x \rightarrow \infty} g(x) =$

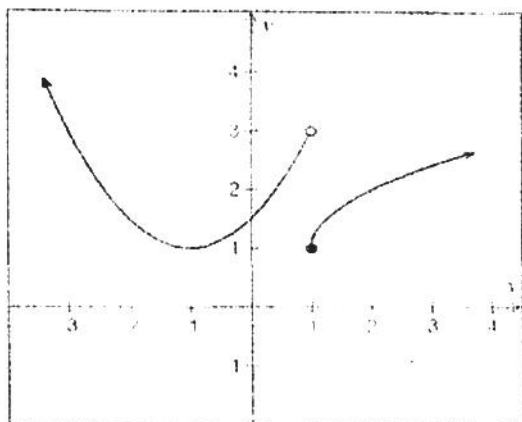
5. $\lim_{x \rightarrow -\infty} g(x) =$

6. $\lim_{x \rightarrow 1} g(x) =$

Finding Limits Analytically Form A

Name _____

Date _____ Period _____



1. In the graph shown above, find the limits.

$$\lim_{x \rightarrow 1^+} f(x) =$$

$$\lim_{x \rightarrow 1^-} f(x) =$$

2. $\lim_{x \rightarrow -\infty} \left(\frac{3}{x+4} \right) =$

3. $\lim_{x \rightarrow 5} \left(\frac{7x}{x-5} \right) =$

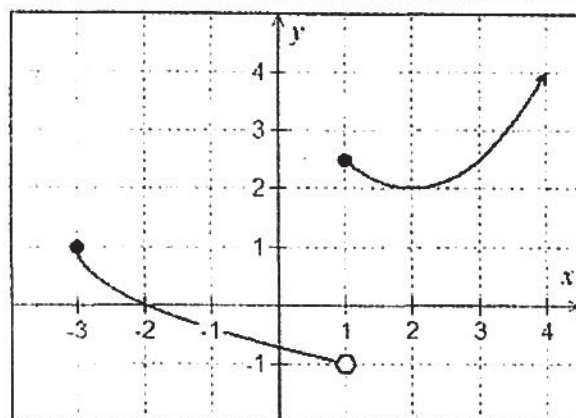
4. $\lim_{x \rightarrow -3} \left(\frac{x^2 + 4x + 3}{x^2 - 3} \right) =$

5. $\lim_{x \rightarrow 2} \sqrt{x+3} =$

Finding Limits Analytically Form B

Name _____

Date _____ Period _____



1. In the graph shown above, find the limits.

$$\lim_{x \rightarrow 1^+} f(x) =$$

$$\lim_{x \rightarrow 1^-} f(x) =$$

2. $\lim_{x \rightarrow 2} \left(\frac{2x}{x-2} \right) =$

3. $\lim_{x \rightarrow \infty} \left(\frac{6}{x-3} \right) =$

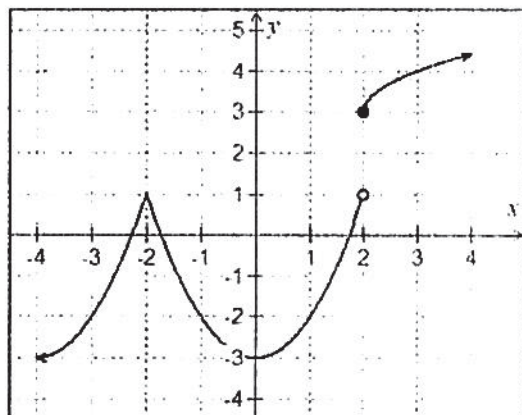
4. $\lim_{x \rightarrow 0^-} \frac{|x-3|}{x} =$

5. $\lim_{x \rightarrow -3} \left(\frac{x^2 + 5x + 6}{x+3} \right) =$

Finding Limits Analytically Form C

Name _____

Date _____ Period _____



1. In the graph shown above, find the limits.

$$\lim_{x \rightarrow 2^+} f(x) =$$

$$\lim_{x \rightarrow 2^-} f(x) =$$

2. $\lim_{x \rightarrow 8} \sqrt{2x-7} =$

3. $\lim_{x \rightarrow -4} \left(\frac{x+4}{x^2-16} \right) =$

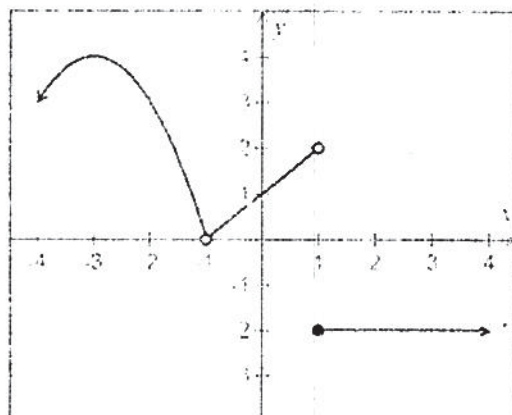
4. $\lim_{x \rightarrow 2} \left(\frac{x^2-4x+4}{x^2-4} \right) =$

5. $\lim_{x \rightarrow 0^+} \frac{|x-4|}{x} =$

Finding Limits Analytically Form D

Name _____

Date _____ Period _____



1. In the graph shown above, find the limits.

$$\lim_{x \rightarrow 1^+} f(x) =$$

$$\lim_{x \rightarrow 1^-} f(x) =$$

2. $\lim_{x \rightarrow 4} \left(\frac{6x}{x-4} \right) =$

3. $\lim_{x \rightarrow 5} \sqrt{9-x} =$

4. $\lim_{x \rightarrow 0^+} \frac{|x-2|}{x} =$

5. $\lim_{x \rightarrow 3} \left(\frac{x^2+6x-27}{x-3} \right) =$

Properties of Limits Form A

Name _____

Date _____ Period _____

Questions 1 – 5: Use the information in the table below to evaluate each limit.

x	-1	0	1	2	3
$f(x)$	6	-5	-3	-1	0
$g(x)$	-8	2	1	-4	2

1. $\lim_{x \rightarrow 1} [f(x) - 4g(x)]$

2. $\lim_{x \rightarrow -1} \frac{2f(x) + 3g(x)}{g(x) - f(x)}$

3. $\lim_{x \rightarrow 0} \frac{[3g(x)]^2}{4 - f(x)}$

4. $\lim_{x \rightarrow 3} [g(x) \cdot (f(x) + 8)]$

5. $\lim_{x \rightarrow 2} \sqrt{4 - 2g(x)}$

Grade:

Properties of Limits Form B

Name _____

Date _____ Period _____

Questions 1 – 5: Use the information in the table below to evaluate each limit.

x	-1	0	1	2	3
$f(x)$	8	-3	-5	2	6
$g(x)$	-6	3	4	0	-1

1. $\lim_{x \rightarrow 1} [f(x) - 3g(x)]$

2. $\lim_{x \rightarrow -1} \frac{3f(x) + 2g(x)}{g(x) - f(x)}$

3. $\lim_{x \rightarrow 0} \frac{[2g(x)]^2}{3 - f(x)}$

4. $\lim_{x \rightarrow 2} [g(x) \cdot (f(x) + 7)]$

5. $\lim_{x \rightarrow 3} \sqrt{2g(x) + 3f(x)}$

Grade:

Properties of Limits Form C

Name _____

Date _____ Period _____

Questions 1 – 4: Use the information in the table below to evaluate each limit.

x	-2	-1	0	1	2
$f(x)$	5	-2	-6	3	4
$g(x)$	-4	-6	3	0	5

1. $\lim_{x \rightarrow 2} [g(x) + 3f(x)]$

2. $\lim_{x \rightarrow -1} \frac{4f(x) - 3g(x)}{f(x) - g(x)}$

3. $\lim_{x \rightarrow 0} \frac{[2g(x)]^2}{3 - f(x)}$

4. $\lim_{x \rightarrow 1} [f(x) \cdot (g(x) + 5)]$

5. $\lim_{x \rightarrow -2} \sqrt{4 - 3g(x)}$

Grade: _____

Properties of Limits Form D

Name _____

Date _____ Period _____

Questions 1 – 4: Use the information in the table below to evaluate each limit.

x	-2	-1	0	1	2
$f(x)$	4	6	-2	0	3
$g(x)$	6	-3	2	5	-4

1. $\lim_{x \rightarrow 2} [g(x) + 2f(x)]$

2. $\lim_{x \rightarrow -1} \frac{3f(x) - 2g(x)}{f(x) - g(x)}$

3. $\lim_{x \rightarrow 0} \frac{[3g(x)]^2}{4 - f(x)}$

4. $\lim_{x \rightarrow 1} [g(x) \cdot (f(x) + 3)]$

5. $\lim_{x \rightarrow -2} \sqrt{2g(x) - f(x)}$

Grade: _____

Limits of Transcendental Functions

Form A

Name _____

Date _____ Period _____

1. $\lim_{x \rightarrow -3} [2^{x+5} - 3]$

2. $\lim_{x \rightarrow 2} \left(\frac{1}{3}\right)^{x-2} - 4$

3. $\lim_{x \rightarrow \infty} 2^{x+2} + 1$

4. $\lim_{x \rightarrow \pi} e^x \cos x$

5. $\lim_{x \rightarrow 2} e^{x-3} + 2$

Grade:

Limits of Transcendental Functions

Form B

Name _____

Date _____ Period _____

1. $\lim_{x \rightarrow -2} [2^{x+3} + 5]$

2. $\lim_{x \rightarrow 3} \left(\frac{1}{2}\right)^{x-4} - 3$

3. $\lim_{x \rightarrow \infty} 3^{x-4} + 2$

4. $\lim_{x \rightarrow \frac{\pi}{2}} e^x \sin x$

5. $\lim_{x \rightarrow 1} e^{x-2} + 2$

Grade:

Limits of Transcendental Functions

Form C

Name _____

Date _____ Period _____

1. $\lim_{x \rightarrow 2} [3^{4-x} + 4]$

2. $\lim_{x \rightarrow -1} \left(\frac{1}{2}\right)^{x-2} - 3$

3. $\lim_{x \rightarrow -\infty} 3^{x+1} + 2$

4. $\lim_{x \rightarrow 0} e^x \sec x$

5. $\lim_{x \rightarrow -2} e^{x+3} + 1$

Grade: _____

Limits of Transcendental Functions

Form D

Name _____

Date _____ Period _____

1. $\lim_{x \rightarrow 4} [3^{6-x} + 2]$

2. $\lim_{x \rightarrow -2} \left(\frac{1}{4}\right)^{x+1} + 3$

3. $\lim_{x \rightarrow -\infty} 2^{x-2} + 4$

4. $\lim_{x \rightarrow \pi} e^x \csc x$

5. $\lim_{x \rightarrow -1} e^{x+1} + 2$

Grade: _____

Limits & Continuity Form A

Name _____

Date _____ Period _____

$$\text{Given: } f(x) = \frac{x-1}{x^2+x-2}$$

1. Find all the values at which f is not continuous.

2. For each discontinuity, state whether they are removable or non-removable.

$$\text{Given: } f(x) = \begin{cases} \frac{x^2-9}{x-3}, & x \neq 3 \\ k, & x = 3 \end{cases}$$

3. What value of k would make $f(x)$ continuous at $x = 3$?

4. State the ordered pair at the transition point where the function becomes continuous.

5. Use the conditions of continuity to explain why f is continuous.

Limits & Continuity Form B

Name _____

Date _____ Period _____

$$\text{Given: } f(x) = \frac{x^2+2x-8}{x-2}$$

1. Find all the values at which f is not continuous.

2. For each discontinuity, state whether they are removable or non-removable.

$$\text{Given: } g(x) = \begin{cases} 9 - x^2, & x < 2 \\ kx, & x \geq 2 \end{cases}$$

3. What value of k would make $f(x)$ continuous at $x = 2$?

4. State the ordered pair at the transition point where the function becomes continuous.

5. Use the conditions of continuity to explain why f is continuous.

Limits & Continuity Form C

Name _____

Date _____ Period _____

Given: $f(x) = \frac{x-5}{x^2-3x-10}$

1. Find all the values at which f is not continuous.
2. For each discontinuity, state whether they are removable or non-removable.

Given: $f(x) = \begin{cases} 3 - x^2, & x < 2 \\ kx - 5, & x \geq 2 \end{cases}$

3. What value of k would make $f(x)$ continuous at $x = 2$?
4. State the ordered pair at the transition point where the function becomes continuous.
5. Use the conditions of continuity to explain why f is continuous.

Limits & Continuity Form D

Name _____

Date _____ Period _____

Given: $f(x) = \frac{x+3}{x^2+2x-3}$

1. Find all the values at which f is not continuous.
2. For each discontinuity, state whether they are removable or non-removable.

Given: $f(x) = \begin{cases} \frac{x^2-1}{x-1}, & x \neq 1 \\ k, & x = 1 \end{cases}$

3. What value of k would make $f(x)$ continuous at $x = 1$?
4. State the ordered pair at the transition point where the function becomes continuous.
5. Use the conditions of continuity to explain why f is continuous.

Limits At Infinity Form A	Limits At Infinity Form B
Name _____	Name _____
Date _____ Period _____	Date _____ Period _____
1. Use the End Behavior Model method to find $\lim_{x \rightarrow \infty} \left(\frac{3-2x}{3x^3-1} \right)$	1. Use the End Behavior Model method to find $\lim_{x \rightarrow \infty} \left(\frac{3-2x}{5x-4} \right)$
2. Find $\lim_{x \rightarrow \infty} \frac{\sqrt{x^4-1}}{-2x^3}$	2. Find $\lim_{x \rightarrow -\infty} \frac{\sqrt{x^2+x}}{-2x}$
3. Find $\lim_{x \rightarrow -\infty} \sqrt{6-x}$	3. Find $\lim_{x \rightarrow \infty} \frac{4 \cos x}{x}$
4. Find $\lim_{x \rightarrow \infty} \frac{x - \sin 2x}{2x}$	4. Find $\lim_{x \rightarrow -\infty} (3 - 2x - 4x^5)$

Limits At Infinity Form C	Limits At Infinity Form D
Name _____	Name _____
Date _____ Period _____	Date _____ Period _____
<p>1. Use the End Behavior Model method to find</p> $\lim_{x \rightarrow \infty} \frac{5-2x^{3/2}}{3x-4}$	<p>1. Use the End Behavior Model method to find</p> $\lim_{x \rightarrow \infty} \frac{5x^{3/2}}{4\sqrt{x}+3}$
<p>2. Find $\lim_{x \rightarrow -\infty} \frac{\sqrt{x^4-1}}{x^3-1}$</p>	<p>2. Find $\lim_{x \rightarrow -\infty} \frac{4x^3+1}{8x^3-5x^2+7}$</p>
<p>3. Find $\lim_{x \rightarrow \infty} \frac{x-\cos x}{x}$</p>	<p>3. Find $\lim_{x \rightarrow \infty} (7-4x^2-2x^3)$</p>
<p>4. Find $\lim_{x \rightarrow \infty} \sqrt{7-x}$</p>	<p>4. Find $\lim_{x \rightarrow -\infty} \frac{x-3\sin x}{x}$</p>